VA DEQ Recommendations
For
Whole-Flock Disposal of Poultry due to Avian Influenza

This brief has been prepared in order to relay DEQ recommendations regarding the most appropriate waste management responses to disposal of entire flocks of poultry after an outbreak of avian influenza (AI). The methods described could potentially be used to address low pathogenic or highly pathogenic forms of the AI virus. All of the disposal options described in the Virginia Poultry Disease Task Force plan "Prevention and Rapid Response for Low Path Avian Influenza (H5 and H7) in Virginia" are included in this document; however, additional detail is provided regarding the order of implementation preferred by DEQ.

Highlights:

- On-site management is preferred over off-site management when environmental impacts are reduced.
- Preferred order:
    1) **In-house Composting**
    2) Out-of-house Composting on-site
    3) Other on-site methods as availability allows (e.g. alkaline hydrolysis, anaerobic digestion)
    4) Landfill off-site
    5) Rendering, incineration, or composting off-site
    6) Burial on-site under emergency permit
- Composting was not successful as a management tool during the 2002 AI outbreak, but recent research and practical application during a later outbreak on the Delmarva peninsula has brought this concept to the forefront as one of the most biosecure and environmentally sound options available.
- Continued in-house composting research, training and establishment of response teams within the poultry industry are currently being expanded to facilitate implementation.
- Biosecurity concerns must be properly managed regardless of the disposal method, and an outbreak of highly pathogenic AI will escalate this priority in order to protect public health.
- For large scale outbreaks, a combination of options implemented in a tiered approach may be necessary.
- Mobile equipment and technology has improved over the past few years, making new management options available, but in need of more research and experience for practical application.

VA DEQ Recommendations
For
Whole-Flock Disposal of Poultry due to Avian Influenza

The proper management of large scale mortalities due to animal disease continues to be a concern in animal production industries. Proper management and disposal is especially important due to potential disease transfer to other animals and possibly to humans, and due to the risk of soil, air, and surface or ground water pollution. There are a number of options for management of diseased animal carcasses and the following lists the preferred order of the options currently available:

1) On-site treatment through In-House Composting;
2) On-site treatment through Out-of-House Composting;
3) On-site treatment through other methods such as Alkaline Hydrolysis or Anaerobic Digestion;
4) Off-site disposal at a permitted landfill;
5) Off-site treatment through Rendering, Incineration or Composting, and
6) On-site burial under emergency permit.

The preferred order balances the need to maintain and manage appropriate biosecurity while ensuring proper waste management. A combination of these options implemented in a tiered approach may be most effective during an AI Outbreak. During an outbreak of highly pathogenic avian influenza, on-site options that are protective of the environment will be preferred in order to limit disease transfer potential.

Most Preferred Methods

On-Site Composting

- Practical and economical
- Process temperatures destroy AI virus in short period of time
- Highest level of biosecurity, no material leaves the farm
- Treats carcasses as well as infected litter
- No DEQ permit required

In-house Composting

- Occurs inside growing house
- Provides highest level of biosecurity
- Can be performed with equipment normally available on farm
- Eliminates potential wind dispersion or access by vectors
- Ongoing research shows promise for full-scale implementation
- Concerns: house design (e.g. double-deck houses) may complicate pile construction, final disposition of product (e.g., stigma associated with composted material.)

Out-of-house Composting

- Occurs after material is removed from growing house
- Provides high level of biosecurity where control measures, such as fleece covers and fencing, minimize or eliminate wind dispersion and access by vectors (scavengers, predatory birds, etc.)
- Static pile method preferred; enclosed vessel exhibited limited success during 2002 AI outbreak (e.g., AgBag system with air induction equipment)
- Concerns: wind dispersion, vector control (e.g., fencing), availability of specialized equipment (AgBag system)

New Technology Applications

The following two methods have not been field tested in VA, but would be preferred over off-site methods if implementation were shown to be practical.

Alkaline Hydrolysis

- High level biosecurity when performed on-site
- Destroys AI pathogen, completely solubilizes and digests carcasses into sterile aqueous solution (pH 10.5-11.5)
- Requires specialized equipment and trained personnel
- DEQ waste permit required
- Concerns: equipment and personnel availability, unknown process rates, biosecurity transportation between farms, logistical coordination of mobile units, effluent disposal (temp, pH, BOD), virus in litter managed separately

Anaerobic Digestion (Biomethanization or Biodigestion)

- Requires size reduction for efficiency, biosecurity concern with preprocessing
- Equipment not available on all farms
- Additional heat needed after process to ensure AI virus destruction
- DEQ waste permit required
- Concerns: equipment availability, unknown process rates, start up times, biosecurity with preprocessing, sludge management, virus in litter managed separately

---

Preferred Off-Site Methods

Landfilling

- Proven, very effective
- Ensures long-term disposal of large volumes of carcasses and litter
- Large landfills accustomed to managing special wastes, have experienced operators with necessary equipment
- Biosecure zone established where material disposed into existing waste disposal unit and immediately covered
- Transport vehicles, operating equipment, and personnel observe biosecurity and decontamination procedures
- Active bird management controls vectors
- VDACS protocols ensure proper packaging and transport
- VDEQ protocols ensure proper disposal at the landfill
- Concerns: transport availability/logistics, biosecurity management during transport

Rendering

- Temperatures adequate to destroy AI virus
- Process reduces volume of biomass needing disposal
- Biosecure facility when dedicated to accepting AI material only
- No DEQ permit required
- Concerns: cost and availability of dedicated facility, redirecting routine waste flow, biosecurity, transportation availability/logistics, market for rendered product, virus in litter managed separately

Off-site composting

- Difficult to implement, no facilities available currently
- Requires property, equipment, manpower, and management
- May not afford a high level of biosecurity due to multiple farms accessing the same site, active management needed to form piles or load vessels, and site security and vector control issues
- DEQ Waste Permit required
- Concerns: biosecurity, siting, time to permit, skilled manpower, final disposition of product

Incineration

- Carcasses difficult to combust (~70% moisture)
- Incineration units difficult to site, no facility available currently
- Skilled operators required
- Requires consistent and quality fuel supply
- Limited availability and capabilities of fixed-based facilities or mobile units (e.g. curtain destructors)
- DEQ Air and Waste Permits required
- Concerns: processing rates, storage of carcasses prior to incineration potential for surface or ground water contamination, smoke (visibility and air pollution), biosecurity, virus in litter managed separately

It is anticipated that all cases would be handled with the aforementioned options. On-site burial remains on the list as an option of last resort should overwhelming circumstances arise making all other options impossible.

On-site burial

- Least desirable
- Requires suitable site, pre-selection of site is recommended.
- Requires DEQ emergency permit
    - Pre-selected sites subject to public participation
    - Deed notification
    - Environmental monitoring required.
- Time to excavate burial pit and construct liner
- USDA may provide assistance in locating equipment vendors and/or contractors
- Concerns: Environmental impacts, site availability/suitability, carcass re-emergence, long-term maintenance/monitoring, future liability, decreased property value, may require future management